

Snow Surveyors Have Tiring Jobs To Measure Contents of Watersheds

By William B. Smart

"Come on, Bill. Time to get at it!"

Don R. Mitchell speaking. Place, a Heber City auto court. Time, 4:25 a.m.

I blinked at my wrist watch. 4:25 a.m. Only four hours earlier we had rolled into Heber City after a drive from Salt Lake City. Somewhere a fool rooster serenaded the pre-dawn blackness. It could be sleeping still if it weren't crazy, Don remarked.

But then, I reflected bitterly, so could I—if I hadn't accepted this chance to go on a snow survey in the high Uintahs.

Typical Day

So this, then, was the typical beginning of a snow surveyor's typical day. It proved to be a day without dramatics. One of many days which, pieced together, develop an invaluable picture for irrigation planning and flood control.

This day's work was to be part of a special flood survey Don is doing this spring. We were to look over snow on the Provo River watershed beginning at its source, Trial Lake, in the tops of the Uintah range.

This particular area is vitally important, I was told. All of northern Utah's principal streams head there within a few miles of each other.

Many Treks

Don, as engineer for the Division of Irrigation, Soil Conservation Service, Department of Agriculture, had made dozens of such trips already this winter. He will make dozens more before the picture is complete and he comes up with his annual water forecast April 1.

Groggy from lack of sleep, I

wondered how he stood this kind of pace day after day.

After breakfast at an all-night beanery, we picked up H. C. Clegg and were on our way. Although careful planning and operations minimize the risk, snow surveyors never travel alone, Don explained. You never can tell what will happen atop a mountain in mid-winter.

Good Companion

"Card" Clegg was about as good a companion as you could find. He had been a native of Heber all his 60-odd years. For 40 years he had been tramping these Uintah mountains as an employee of the Provo River Water Commission.

He is one of nearly 100 forest rangers, national park rangers

and water commission employees who help in measuring snow at 82 courses in the state.

The sky was light when we reached the state fish hatchery a few miles from Kamas. There, at the end of the cleared road, we unloaded Don's snow-mobile from its trailer. This machine, a tracked affair with guiding skis in front, was developed by the irrigation division at its headquarters in Logan. It is far superior to snow planes or weasels for this type work, Don claimed. He proved his point.

In High Lakes

Up the unplowed road we clattered. Trial Lake, 27 miles from Kamas, was our destination. Card pointed out Beaver Creek, Soapstone camp ground, Alexander Lake (where polygamists used to hide out in the early Manifesto days), the uncompleted Duchesne tunnel, Notch Mountain, Reed's Peak, Mt. Baldy—all familiar names to summertime fishermen and campers, but seldom seen by man in mid-winter.

By noon we were at Trial Lake, head of Provo River, elevation 9800 feet. Within a few miles of this point head northern Utah's four major rivers—the Duchesne, Bear, Weber and Provo—branching out to the east, north, west, and southwest.

Trial and Error

Here we went to work. A snow course, I now found, is simply a line marked off by two orange markers, along which snow samples are taken. Its location is determined empirically—that is, by trial and error. Areas at which snow measurements over the years most nearly coincide with water runoff in the valley below are established as snow courses. It's that simple.

Most of them were set up by George D. Clyde, former dean of engineering at USAC, now head of the Irrigation Division. He started the work in Utah in 1920.

This particular course is 550 feet long. We took 12 samples—at 50 foot intervals.

Take Snow Sample

A sample is taken by plunging a hollow aluminum tube into the snow down to the ground. The tube is marked off in inches, giving the snow depth. The snow-filled tube is then weighed. A quick mathematical calculation gives the amount of water inches lying on that part of the watershed.

We measured two other courses on the Provo River watershed farther down. At Soapstone the course was an X-shaped affair. At Beaver Creek it ran 1000 feet over a meadow.

When it was over I ventured

much more water up there than usual, it's much more concentrated, due to a month of settling and a little melting. That means it will come off faster when the thaw starts.

At Trial Lake there were 29.8 inches of water in 80.7 inches of snow. Better than 30 per cent water. We don't ordinarily get that much water concentration until almost May, Don explained.

On the lower courses the picture was much the same, but smaller wetter doses.

Will Revise Forecasts

There is still a definite flood danger threat on every watershed in the state, Don emphasized. Original forecasts will be revised downward somewhat due to the lack of snowfall during March, but still all but three watersheds have more than 100 per cent of their April 1 normal.

On the Sevier River the snow blanket is 25 per cent of normal.

Then there's that dangerous early concentration factor.

Forecasting floods is not ordinarily a part of Don's business. That's the weather bureau's department. Ordinarily Don's forecasts are given in acre-feet of water, primarily for the benefit of irrigation planning.

Variety of Uses

But the information obtained finds a wide variety of uses. It provides vital data to operation of hydro-electric plants, is valuable to credit agencies regulating farm and livestock loans, is used extensively by the Migratory Waterfowl Division providing adequate nesting and feeding waters for ducks and geese.

Mining operations, municipal water systems protection of watersheds from fire and excessive grazing and federal crop estimating are among other activities which have come to lean heavily on the snow survey program.

Experimental Forecast

This year's flood forecast will be something of an experiment. It will be made available only to the Bureau of Reclamation in effort to forestall excessive damage this spring.

By dark we were through a part company. Don pointed truck, trailer and snow-mobile down toward Fairfield where would start on another jaunt before dawn the next day. At that a long drive to south Utah for a survey in the Breaks country the day following.